SCIENCE SPECTRUM

MAGAZINE

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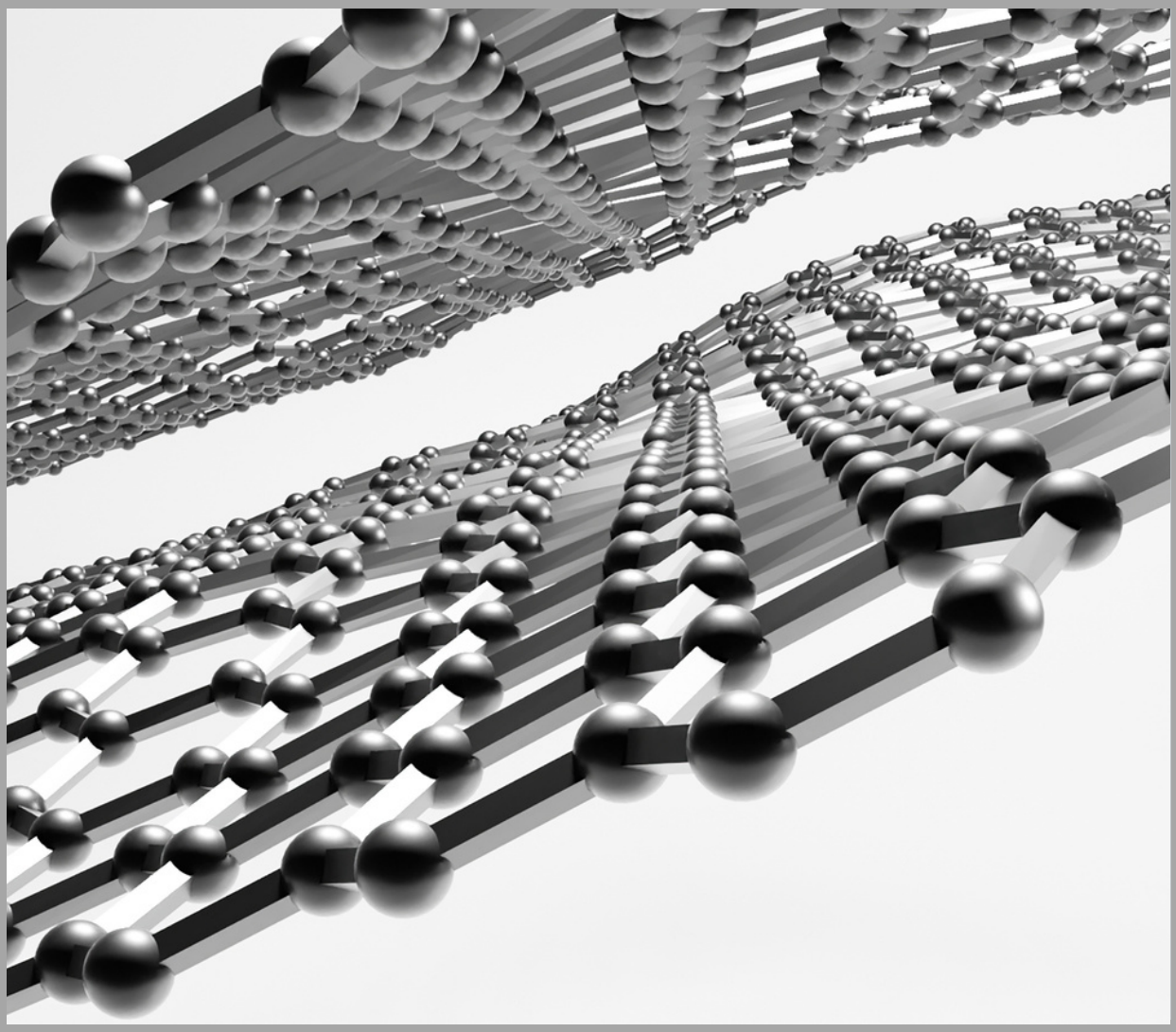

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	Graphene

Graphene: the most famous allotrope of carbon

Graphene is probably a word that you've never heard of. But it's actually a powerful material on Earth. It even is making rounds in the field of science and technology. Let's get to know what graphene is all about and what it is made of.

Graphene is an allotrope of carbon in the company of one layer of atoms organized in a hexagonal lattice nanostructure. In other words, graphene is another physical form of carbon, where all carbon atoms are arranged differently than the element of carbon. More specifically, graphene has a length of a single carbon atom layer, whereas carbon fiber has a micrometer scale thickness [1].

Before monolayer graphene was isolated in 2004, it was theoretically accepted that two-dimensional compounds could not exist due to thermal instability when separated. Nevertheless, once graphene was isolated, it questioned the value of this theory was. After suspended graphene sheets' studies by transmission electron microscopy, scientists believed that they found the reason to be due to slight rippling in the graphene, modifying the structure of the material. Anyhow, later research suggests due to the strength of the carbon-to-carbon bonds in graphene they prevent thermal fluctuations from destabilizing it [2].

There are similarities between carbon and graphene; nonetheless, due to the dissimilarity with the carbon structure, there are more differences than similarities. The key difference between carbon nanotubes and graphene is that carbon nanotubes show metallic or semiconducting properties, whereas graphene shows a semimetal nature. Carbon nanotubes are a type of tube that is made up of carbon atoms, and the diameter of these tubes is typically measured with a nanometer scale.

Some main properties of graphene are as follows:

- High thermal conductivity.
- High electrical conductivity.
- High elasticity and flexibility.
- High hardness.
- High resistance.
- Ionizing radiation is not affected.
- Able to generate electricity by exposure to sunlight.
- Transparent material.

Graphene is used in transportation, medicine, electronics, energy, defense, and desalination; the range of industries where graphene research is making an impact, is substantial. More respectively, graphene is used in electric devices. It can be used as a coating to improve current touch screens for phones and tablets. It can also be used to make the circuitry for our computers, making them incredibly fast. These are only two examples of how graphene can enhance today's devices, nevertheless there are many more examples.

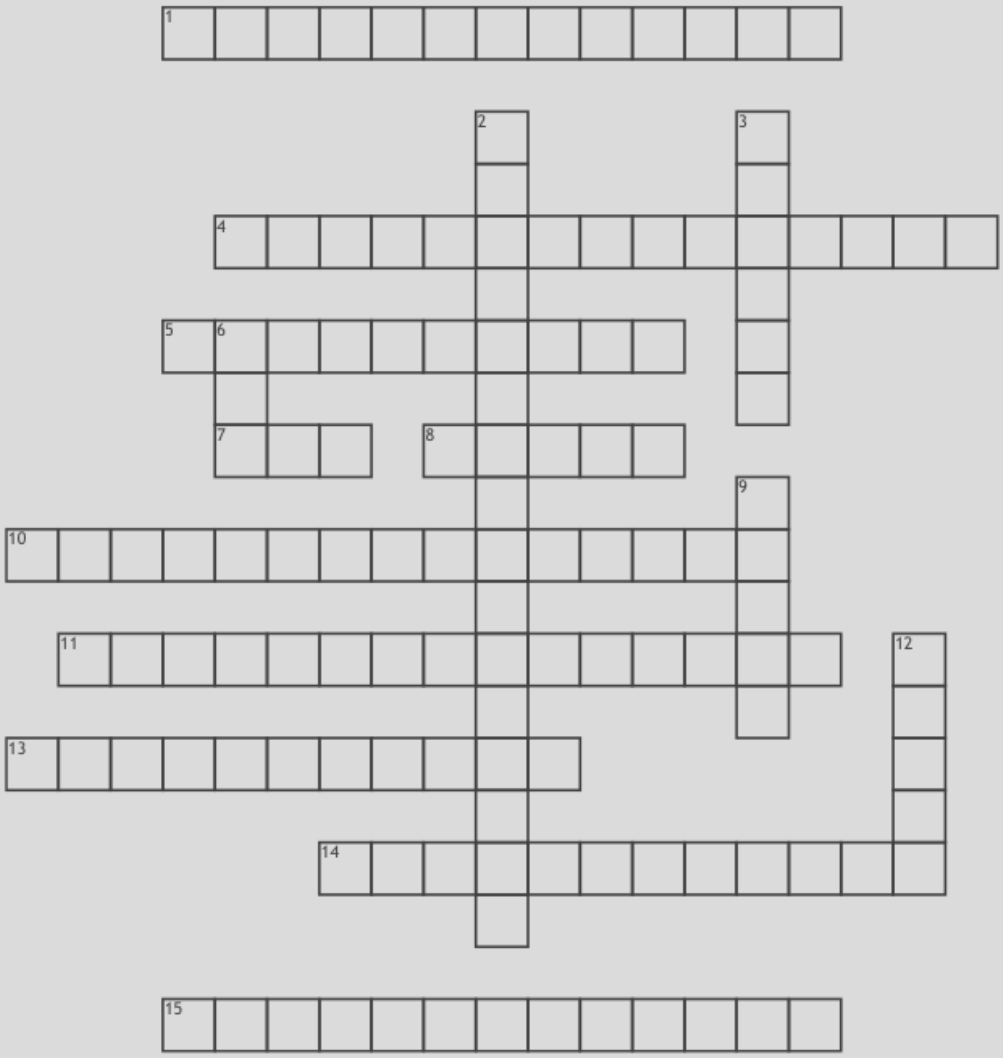
In conclusion, graphene was and is an essential material for human progress. It is used in many scientific fields for improving our technology and inventing new ones. Learning about materials like this shall guide humankind into a successful route of progress [3].

Resources:

[1] https://matmatch.com/learn/material/graphene
[2] https://www.graphenea.com/pages/graphene-properties#.Y6B8KnbMLIW
[3] https://www.differencebetween.com/difference-between-graphene-and-carbon-fiber/

Crossword

Simple Machines



Across

1. Simple machine that has a straight, slanted surface

4. Most common type of lever

5. All inclined planes must have this kind of angle

7. The FE/FR

8. Made up of a twisted inclined plane

10. Two simples machines made into one

11. A lever where the effort force is between the resistance force and the fulcrum

13. The type of pulley where the effort force is the same but the direction is changed

14. Has two circular objects that are different sizes

15. A machine that makes life easier

Down

2. A lever where the resistance force is between the effort force and fulcrum

3. Simple machine that uses a wheek to pull a rope or cable

6. The DE/DR

9. Simple machine that has a bar and pivots at a fixed point

12. Made up of two inclined planes

ANSWERS AT THE BACK

WORD SEARCH

Q I K E S N A Q F Q L A Q N S Q O I V A D O L W
Z E S G I C H W T E N S I O N L N Q A L R S J R
B C Z D S A E H O C X S I I R A Y G C Q V S E F
Z R D I F D K L U S D M Q T D M H O P L X V B J
N O V R O A E A B M W W U A M T P P W M E X E X
E F I B B I L H X A Z U A D H J T Q D L C G Z W
G A J M P C K R Q F T Y E N A O Z A I E D F Q M
I S P A N E C R A S U S B U X E A T D I J F Y A
R I Y E L Y U L Q T I T K O B H N G R S S M A H
B H B B C C B T S Z C R E F W A T B N A E R S M
D Y W X X F L O O R B E A M C Z S L K L C R U D
E I M T S U K E Q G R Y R O B S M Y O H C N P Q
Y K S N L Y J N A O N X T O U G R O B U J A P O
A N Q G F E Z A D N O P J R J L B R B G Z H O W
T N I H Z L D B Y Q I X T E J I I B L J P R R J
S D I A G O N A L A S N T C T D F S W E O G T H
E M M D V G V R P K S M R C G N H D L Q O I I I
L N O W S Q C J N R E Y B E Z A E K Y Z Y X N A
B E C I J M G D B A R S A H Q C E M M C D O E T
A R J N A E S D W A P E V R K O A E T D H D Y H
C U D Q I U A Z B F M P X E Y E B X A U S M E B
N H H W V O J M M S O K T I P H Z P U B B J A I
F W T A L V Q K Q U C F H P C A E C R B Z A E N
T F X X O J F T M C B K N Q F E D A Y H Z W A U

abutment
arch bridge
beam bridge
buckle
cable stayed brige
cantilever
compression
deck
diagonal
floor beam
force
foundation
joint
load
pier
span
stable
support
tension
truss bridge

ANSWERS AT THE BACK

RIDDLES

1. I am a rock bigger than Venus but smaller than Uranus. What am I?

2. What is a Priest's favorite part about Physics?

3. What is full of holes but still holds water?

4. I can rush, I can be hot, I can be cold, I can be hard, I can slip through anything. What am I?

5. It is impossible for me to be created, and I can never be destroyed, I can only change form. What am I?

6. You can't see me, but I can see you; To be more specific, I see through. What am I?

ANSWERS AT THE BACK

RIDDLE ANSWERS

1. Earth

2. Mass

3. A sponge

4. Water

5. Energy

6. An X-ray

Cool Things to Check Out

COMPETITIONS:

- HTTPS://WWW.IMMERSE.EDUCATION/ESSAY-COMPETITION/

WEBSITES:

- HTTPS://GRAPHENE-FLAGSHIP.EU/
-

COURSES:

- HTTPS://WWW.COURSERA.ORG/SEARCH?QUERY=GRAPHENE&